CLADDING FOR BUILDINGS

Field of the Invention

The present invention concerns cladding for buildings, especially walls, and more particularly, materials for cladding buildings, a method of cladding building blocks, and a cladded building block.

Background of the Invention

In order to provided an aesthetically pleasing finish to walls of buildings, it is known in the trade to clad the walls with other, more decorative materials, such as with a veneer of marble, wood, portland stone or granite.

However, this means of cladding buildings has a number of disadvantages in that it is relatively expensive, especially when materials such as marble are used for cladding and furthermore, it is time consuming to the builder, who has to adhere the

separate sheets of cladding to the building, one by one, after having built the wall. In addition, many of the materials, which are in general used for cladding of exterior walls in particular, are not weather proof, and so must subsequently be treated with a suitable water-proofing material.

An object of this invention is to overcome, or at least alleviate the above-mentioned disadvantages.

Summary of the Invention

A first aspect of the invention provides a matrix composition for use in cladding building blocks, comprising de-gassed polyester resin, filler material and catalyst.

A second aspect of the invention provides a cladding element made from the aforesaid matrix composition.

Preferably the cladding element comprises an exterior surface having a peripheral rim defining a recessed rear surface. The cladding element may be a substantially rectangular element having a planar exterior surface. Alternatively, the exterior surface may comprise two faces disposed at angles to one another, most usually at right angles to one another.

The cladding element may be made in a mould. A rigid mould is preferred which precisely defines the configuration of the peripheral edges of the cladding element to provide the desired straight edges. Straight edges are preferred so that the edges of the cladding element can abut adjacent cladding elements and provide tight

joints. Tight joints which render grouting unnecessary are preferred. Any suitable moulding technique may be used. The materials employed for the cladding element may be as described further hereinafter.

A third aspect of the invention provides a method of cladding a building block comprising securing the aforedescribed cladding element to a building block using an adhesive. The adhesive may be a catalyst activated resin or any other suitable adhesive.

A fourth further aspect of the present invention provides a method for cladding a building block, comprising mixing together de-gassed polyester resin, filler material and catalyst to form a matrix composition, then contacting at least a side or a face of the building block with the matrix composition, which may be contained within a mould, allowing the matrix composition to set to form a solid surface on the building block, and them removing the cladded building block from the mould.

A fifth aspect of the present invention provides a building block, which has been clad using a matrix composition comprising de-gassed polyester resin, filler material and catalyst.

The building block may be a concrete block, building brick or any other sort of block used for building, for example, a lightweight concrete block, or a load bearing concrete block.

The catalyst included in the matrix composition facilitates the setting of the matrix to form a solid surface. In an embodiment of the invention according to the

fourth aspect, it is preferred that the cladding adheres to the building block by way of contraction of the matrix composition onto the building block as it sets. In a method according to the fourth aspect it is preferable that the composition has a viscosity such that, when the building block is placed in the composition, it does not completely immerse therein, but instead allows a depth of composition between the building block and the bottom of the mould to provide a finished thickness of cladding of between one sixteenth of an inch and one inch, more preferably still, one eighth of an inch. Alternatively, the building block may be suspended in the matrix composition by way of temporary attachment to an appropriate part of the mould.

Preferably, according to the fourth aspect, the mould is shaped such that one face, or alternatively, opposite faces, of the building block is or are cladded, and further that the solid surface formed has a lip extending around the perimeter of the face of the building block, which has been cladded. This enables a continuous solid surface to be formed by the cladding, in that if the lip was omitted, then mortar, which is used between the building blocks to hold them together, would cause gaps between adjacent pieces of cladding, thus giving a discontinuous finish, which may not be acceptable.

More preferably still, the building block is cladded in such a way that the cladding extends at least part way down those sides of the building block adjacent that face, which has been cladded. This enables the cladding to contract onto the building block and be held thereon.

The mould for implementing the method of the fourth aspect preferably comprises a carrier. The carrier is preferably made from fibreglass. The carrier preferably holds a rubber mould component, which contains the composition. Preferably, the mould further includes a collar attachment, which in use, holds the building block to be cladded, in place. It is preferable that the collar may be split into at least two pieces, in order to enable it to be placed over the building block when one side of the block has already been cladded.

In a preferred embodiment of the invention, the matrix composition further comprises one or more pigments, which may be added to the matrix composition in quantities dependent upon the desired effect to be achieved.

The materials forming the matrix composition may be transferred into the mould by means of a transfer tube, whereby smaller injection tubes inject pigment or a mixture of pigments into the matrix, as it passes through the transfer tube, thereby producing a veining effect in the solid surface subsequently produced.

Preferably, in order to achieve the different effects on the solid surface, the amount and type of filler used in the matrix composition is varied, along with the amount and type of pigment, and the type of mould used.

Preferably, the inside of the mould is sprayed with a speckled combination of materials, for example, polyester chips, in order to give an uneven effect, which may be desirable, if, for example, certain types of stonework is to be assimilated.

The filler used in compositions of the invention preferably makes up between 75 and 80% by weight of the matrix composition, the de-gassed polyester resin makes

up between 20 and 25% by weight of the matrix composition, and the remainder of the matrix composition is made up of catalyst and pigment.

It is preferred that the filler may be a natural material or a synthetic material, or comprise a mixture of natural and synthetic materials to achieve the desired appearance. Examples of fillers are: crushed calcium carbonate, aluminum trihydrate, sand, specially prepared spray mixes, and polyester chips. Having got the cladded building block, the wall may then be built.

Brief Description of the Figures

The present invention will now be described with reference to the accompanying drawings in which:

Figure 1 shows a cross-sectional view of a cladded building block, in accordance with an aspect of the present invention;

Figure 2 shows a cross-sectional view of a number of cladded building block, in accordance with an aspect of the present invention;

Figure 3 shows a perspective view of a cladded building block in accordance with an aspect of the present invention;

Figure 4 shows a perspective view of a mould used in the cladding process, in accordance with an aspect of the present invention;

Figure 5 shows a cross-sectional view of a mould used in the cladding process, showing a building block in place in accordance with an aspect of the present invention;

Figure 6 shows a cross-sectional view of the mould used in the cladding process, showing a building block, which already has one face cladded, in place, in accordance with an aspect of the present invention;

Figure 7 is a front perspective view of a one embodiment of cladding element in accordance with an aspect of the present invention;

Figure 8 is a rear perspective view of the cladding element of Figure 7; and

Figure 9 is a perspective view of another embodiment of cladding element attached to a building block in accordance with an aspect of the invention.

Detailed Description of the Invention

With reference to Figures 1 to 3, a face 1 of a building block 2 has cladding 3 applied thereto, the cladding 3 forming a lip 4 around the building block 2. As can be seen from Figure 2 in particular, the lip 4 allows for the thickness of mortar 5 between adjacent building blocks 2, thereby preventing any gaps between adjacent cladded building blocks. The cladding 3 also extends down the sides 6 of the building block 2, which enables the cladding to be held securely on the building block, when the matrix composition contracts and sets.

The thickness A of the cladding 3 must not be so thick that, when the matrix composition contracts and sets, the solid surface forming the cladding, becomes distorted. Furthermore, the more matrix composition used in the cladding process, the more expensive the cladding will be. However, the cladding thickness A must not be so thin that it is susceptible to cracking, and accordingly, an optimum thickness A

is reached, which is about one eighth of an inch (approx. 3 mm). Figure 3 shows the solid surface 7, which is formed.

As can be seen from Figures 4 to 6, a mould 8 comprises a fibreglass carrier 9, which is used to encase a rubber mould component 10. The rubber mould component 10 holds matrix composition 11, which sets to form a solid surface 20 on a building block 13, held within the mould. A collar 12 holds the building block 13 to be cladded, in place. The collar 12 is attachable to rubber mould component 10, in order to keep the collar in place when the building block 13 is being held in the matrix composition 11. Referring to Figures 4 and 6 in particular, the collar 12 may be split into two parts 16 and 17, in order to enable opposite sides 14 and 15 of the building block 13 to be cladded. For example, the first side 14 is placed in the matrix composition 11 held within the mould 8. The building block 13 is held therein by the collar 12, and cladded, and then the building block 13 is turned over, and the opposite side 15 is placed in the matrix composition, whereby the collar is then split into two pieces 16 and 17 to enable it to fit over the already cladded building block, and thereby secure it in the mould whilst the other side 15 is cladded.

The matrix composition for the cladding comprises a de-gassed polyester resin, filler material and catalyst. The filler material makes up between 75% and 80% by weight of the matrix composition, the de-gassed polyester resin makes up between 20% and 25% by weight of the matrix composition and the remainder of the composition is made up of catalyst and pigment. The preferred filler material comprises a mixture of natural and synthetic material. The natural materials may be

selected from calcium carbonate, aluminum tri-hydrate and sand. The synthetic material may comprise polyester chips.

Referring now to Figures 7 and 8, there is illustrated a first embodiment of preferred cladding element made from the aforedescribed matrix composition. It is made in a mould by any convenient means and not described in further detail. The mould may be a rubber or a rigid material. Rubber has the advantage of being relatively cheap to make a mould, but its flexibility necessitates greater finishing of the moulded article. Thus a rigid mould is to be preferred. The essential characteristics of the cladding element, that distinguishes it from other cladding elements in the nature of tiles, is that the quantity of material required to make the tile is reduced by virtue of the fact that its rear surface 70 is recessed. Its front face 72 is bounded by a peripheral rim 74. A rim width of 15 mm is preferred but it may be in the range of 10-20mm. The opposite edges 76, 78 are parallel to one another and at right angles to the opposite end edges 80, 82 which are parallel to one another. The edges are straight so ensure close fitting of adjacent cladding elements. A rectangular configuration is chosen to match the shape of the building blocks with which the preferred cladding elements will be used as practice. They are dimensioned to be just larger than the building blocks with which they will be used so that the peripheral rim extends around the edges of the block. The cladding element is dimensioned to accommodate the tolerance variations of the blocks in question. The cladding element is secured to the block using a catalyst activated resin. We have found that a resin of the same type as that employed for forming the cladding element works quite

well, and secures a positive bond between the cladding element and the block. It is preferred that the cladding is applied to the building block before it is laid. Thus laying of the pre-cladded blocks relies on the edges of the cladding element to align the pre-cladded blocks on the laying thereof. The cladded block looks much like that illustrated in Figures 1 and 3. It will be appreciated that the cladding element will also be made in half sizes. They may be cut to any other size required.

It is also feasible to apply the preferred cladding elements after the block wall has been built up. This simply requires the mortar joints between the blocks to be raked out to a sufficient depth to allow the peripheral edges of the cladding element to be inserted and of course the thickness of the joints has to be sufficient to accommodate the thickness of the peripheral rims of two cladding elements. In such a method the adhesive for securing the cladding element in place may be applied to the surface of the blocks or to the reverse side of the cladding element. it has to have a viscosity which allows it to be applied in this manner.

Figure 9 illustrates an alternative configuration of cladding element. The cladding element shown adhered to a backing element for use as a quoin is preformed as in the embodiment of Figures 7 and 8 and has two exteriors faces 90, 92 disposed at right angles to one another. The exterior faces are bounded by a peripheral rim 94. Thus the cladding element is recessed to its rear surface. The face 92 is illustrated as twice the length of the face 90. The backing for the cladding element comprises a full block 96 and a part block 98. The part block may be omitted where the face 92 only has to cover the thickness of the block 96.

The cladding of the invention provides a waterproof finish to building blocks, in particular due to the de-gassed nature of the polyester resin, which substantially prevents the formation of air pockets and pits, which may reduce the water proof nature of the cladding, if present. The cladding of the invention provides a cheaper alternative to claddings such as, for example, marble and granite, and has the added advantage of being waterproof.

According to one aspect of the present invention, building companies may be supplied directly with building blocks having the cladding already applied thereto, which would further reduce costs. In an alternative, the pre-formed cladding elements are supplied for fixing to building blocks. This minimizes transportation costs. Most usually there would be fixed in place before the building blocks are laid but they could be applied afterwards as described above.

In addition, matching cladded building blocks may be ordered by building companies, having similar colour, tone, features, etc., to those which have been in place for months or even years.